

Appln. No.: 10/088,275
Amendment Dated December 10, 2003
Reply to Office Action of September 10, 2003

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Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Currently Amended) A light-receiving element for detecting a light intensity and a barycenter thereof for an incident light of a long-wavelength, comprising:

a semiconductor layer of III-V group compound semiconductor;

a first conductivity-type of resistor layer provided on the top surface of the semiconductor layer;

a second conductivity-type, opposite to the first conductivity-type, of substrate provided on the bottom surface of the semiconductor layer; and

at least one pair of opposing electrodes provided on the resistor layer, wherein the pair of opposing electrodes are configured to provide first and second signals indicative of a position of the incident light on the resistor layer.

2. (Original) The light-receiving element of claim 1, wherein the III-V group compound semiconductor is selected from the group consisting of InGaAs, GaAs, AlGaAs, InAs, and InGaAsP.

3. (Original) The light-receiving element of claim 2, wherein the III-V group compound semiconductor is InGaAs.

4. (Original) The light-receiving element of claim 3, wherein when the first conductivity -type is p-type and the second conductivity-type is n-type, the first conductivity-type of resistor layer is a p-type InP layer, and the second conductivity-type of substrate is an n-type InP substrate.

5. (Original) A photodetector for detecting a light intensity and a barycenter thereof for each of lights demultiplexed from an incident light, the incident light including N (N is an integer equal to or larger than 2) time-divisoned wavelengths, comprising;

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one light-receiving element of any one of claims 1-4, wherein the one light-receiving element is operated in N time-devised timing matched to the impinging timing of respective demultiplexed lights.

6. (Original) A photodetector for detecting a light intensity and a barycenter thereof for each of lights demultiplexed from an incident light, the incident light including N (N is an integer equal to or larger than 2) wavelengths, comprising;

N light-receiving element of any one of claim 1-4, these light-receiving elements being arrayed in one dimension.

7. (Original) A photodetector for detecting a light intensity and a barycenter thereof for each of lights demultiplexed from an incident light, the incident light including N (N is an integer equal to or larger than 2) wavelengths, comprising;

a first photodetecting means for detecting a barycenter of a light-intensity of each of the demultiplexed lights, the first photodetecting means including N light-receiving elements of any one of claims 1-4 arrayed in one dimension; and

a second photodetecting means for detecting a light intensity of each of the demultiplexed lights, the second photodetecting means including N light-receiving elements arrayed in one dimension.

8. (Original) The photodetector of claim 7, wherein the light-receiving elements of the second photodetecting means are photodiodes.

9. (Original) A photodetector for detecting a light intensity and a barycenter thereof for each of lights demultiplexed from an incident light, the incident light consisting of multiplexed bands each including a plurality of wavelengths, comprising:

a plurality of light-receiving elements of any one of claims 1-4 for every band, the plurality of light-receiving elements being arrayed in one dimension.

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10. (Withdrawn) An optical demultiplexer for demultiplexing an incident light including multiplexed wavelengths, comprising:

an optical means for demultiplexing the incident light into a plurality of lights; and

a photodetector of claim 5 for receiving the plurality of light demultiplexed by the optical means.

11. (Withdrawn) An optical demultiplexer for demultiplexing an incident light multiplexed wavelengths, comprising:

an optical means for demultiplexing the incident light into a plurality of lights; and

a photodetector of claims 6 for receiving the plurality of light demultiplexed by the optical means.

12. (Withdrawn) An optical demultiplexer for demultiplexing an incident light multiplexed wavelengths, comprising:

an optical means for splitting the incident light into two lights; and

a first optical means for demultiplexing one of the two lights;

a second optical means for demultiplexing the other of the two lights;

a photodetector of claim 6 for receiving the lights demultiplexed by the first optical means for detecting a barycenter of a light intensity for each of the demultiplexed light; and

a light-receiving element array for receiving the lights demultiplexed by the second optical means for detecting a light-intensity for each of the demultiplexed lights.

13. (Withdrawn) The optical demultiplexer of claim 12, wherein the light-receiving element array is a photodiode array.

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14 (Withdrawn) An optical demultiplexer for demultiplexing an incident light consisting of multiplexed bands each including a plurality of wavelengths, comprising:

an optical means for demultiplexing the incident light into a plurality of lights for every band; and

a light-receiving means for receiving the demultiplexed lights for every band, the light-receiving means including a plurality of photodetectors of claim 6.